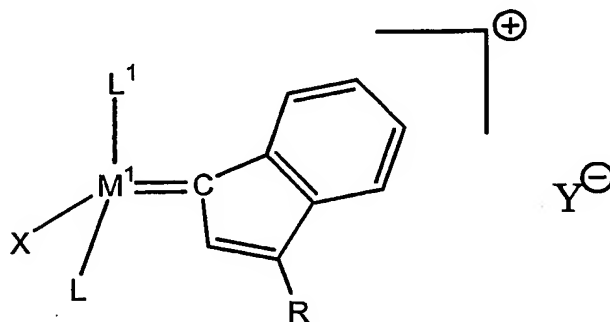


Claims

1. A process for the preparation of an, optionally hydrogenated, nitrile rubber comprising the steps of
- 5 a) reacting a nitrile rubber in the presence at least one compound selected from the group consisting of compounds of the general formula I,



Formula 1

wherein:

M^1 is Os or Ru;

R is hydrogen or a hydrocarbon selected from the group consisting of C_2 - C_{20} alkenyl, C_2 - C_{20} alkynyl, C_1 - C_{20} alkyl, aryl, C_1 - C_{20} carboxylate, C_1 - C_{20} alkoxy, C_2 - C_{20} alkenyloxy, C_2 - C_{20} alkynyloxy, aryloxy, C_2 - C_{20} alkoxy carbonyl, C_1 - C_{20} alkylthio, C_1 - C_{20} alkylsulfonyl and C_1 - C_{20} alkylsulfinyl;

X is selected from any anionic ligand; and

L^1 is a neutral π -bonded ligand, preferably but not limited to arene, substituted arene, heteroarene, independent of whether they are mono- or polycyclic;

L is a ligand selected from the group consisting of phosphines, sulfonated phosphines, fluorinated phosphines, functionalized phosphines bearing up to three aminoalkyl-, ammoniumalkyl-, alkoxyalkyl-,

alkoxycarbonylalkyl-, hydroxycarbonylalkyl-,
hydroxyalkyl- or ketoalkyl- groups, phosphites,
phosphinites, phosphonites, phosphinamines, arsines,
stibenes, ethers, amines, amides, imines, sulfoxides,
5 thioethers and pyridines;
Y⁻ is a non-coordinating anion; and optionally further in
the presence of at least one co-olefin and

10 and for the hydrogenated nitrile polymer
b) hydrogenating the product of step a).

2. A process according to claim 1 wherein the nitrile rubber is
hydrogenated and the hydrogenation is performed under homogeneous
15 catalytic conditions.
3. A process according to claim 2 wherein the hydrogenation is carried out
in situ; that is, without first isolating the product of step a).
- 20 4. A process according to any of claims 1-3 wherein L is a
trialkylphosphine, L¹ is 1-methyl-4-iso-propylphenyl, X is a chloride ion,
R is phenyl and M is ruthenium.
5. A process according to any of claims 1-4 wherein the ratio of compound
25 to nitrile rubber is in the range of from 0.005 to 5.
6. A process according to any of claims 1-5 when conducted in the
presence of at least one co-olefin.
- 30 7. A process according to any of claims claim 1-6 wherein the process is
carried out in an inert solvent selected from the group consisting of
monochlorobenzene, dichloromethane, benzene, toluene, tetra-
hydrofuran and cyclohexane.

8. A process according to any of claims 1-7 wherein the nitrile rubber is hydrogenated and the hydrogenation is carried out using a catalyst of formula :



wherein each R^8 is independently selected from the group consisting of a C_1 - C_8 -alkyl group, a C_4 - C_8 -cycloalkyl group, a C_6 - C_{15} -aryl group and a C_7 - C_{15} -aralkyl group;

10 B is selected from the group consisting of phosphorus, arsenic, sulfur, and a sulfoxide group ($S=O$) ;

X^3 is selected from the group consisting of hydrogen and an anion; and

l is 2, 3 or 4, m is 2 or 3 and n is 1, 2 or 3.

- 15 9. A process according to claim 8 wherein the hydrogenation catalyst is $(PPh_3)_3RhCl$.